



FCC RF Test Report

Product Name: Smart Phone

Model Number: H1511

Report No: SYBH(Z-RF)011072015-2006

FCC ID: QISH1511

Reliability Laboratory of Huawei Technologies Co., Ltd.

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Notice

1. The laboratory has Passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.
2. The laboratory has Passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.
3. The laboratory has been listed by the US Federal Communications Commission to perform electromagnetic emission measurements. The site recognition number is 97456.
4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-2.
5. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. The test report is only valid for the test samples.
8. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.



Applicant: Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd.,
Bantian, Longgang District, Shenzhen, 518129, P.R.C

Date of Receipt Sample: 2015-08-19
Start Date of Test: 2015-08-19
End Date of Test: 2015-08-26

Test Result: Pass

**Approved by Senior
Engineer:**

2015-09-11

Liu Chunlin

Date

Name

Signature

Prepared by:

2015-09-11

Wu Tingsi

Date

Name

Signature



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1 General Information

1.1 Applied Standard	
Applied Rules:	47 CFR FCC Part 02: 2014 FCC Part 15 Subpart C (15.225): 2014
1.2 Test Location	
Test Location 1:	Reliability Laboratory of Huawei Technologies Co., Ltd.
Address:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C
1.3 Test Environmental Condition	
Ambient Temperature:	20 – 25 °C
Ambient Relative Humidity:	45 – 55 %
Atmospheric Pressure:	101 kPa

2 Summary

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Reference
15.225 (a)	In-Band Emissions	15.848μV/m @ 30m 13.553 – 13.567 MHz	RADIATED	Pass	Section 5.2
2.1049	20 dB Bandwidth	N/A		Pass	Section 5.1
15.225(b)	In-Band Emissions	334μV/m @ 30m 13.410 – 13.553 MHz 13.567 – 13.710 MHz		Pass	Section 5.2
15.225(c)	In-Band Emissions	106μV/m @ 30m 13.110 – 13.410 MHz 13.710 – 14.010 MHz		Pass	Section 5.2
15.225(d) 15.209	Out-of-Band Emissions	Emissions outside of the specified band (13.110 – 14.010 MHz) must meet the radiated limits detailed in 15.209		Pass	Section 5.3
15.225(e)	Frequency Stability Tolerance	± 0.01% of Operating Frequency	Temperature Chamber	Pass	Section 5.4
15.207	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits	LINE CONDUCTED	Pass	Part 15B report

3 Product Description

3.1 Product Information

3.1.1 General Description

H1511 is subscriber equipment in the LTE/WCDMA/CDMA/GSM system. The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900. The HSPA+/UMTS frequency band is Band I and Band II and Band IV and Band V. The CDMA/1XEV-DO band is BC1 and BC0 and BC10. The LTE frequency band is B2 and B3 and B4 and B5 and B7 and B12 and B13 and B17 and B25 and B26 and B29 and B30 and B41. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/HSPA/UMTS and GSM/GPRS/EDGE and CDMA2000 1x and 1XEV-DO protocol processing, voice, video MMS service, GPS, AGPS NFC and WIFI etc. Externally it provides micro SD card interface (it can also used as micro SD card interface), earphone port (to provide voice service) and USIM card interface. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

3.2 EUT Identity

NOTE: Unless otherwise noted in the report, the functional boards installed in the units shall be selected from the below list, but not means all the functional boards listed below shall be installed in one unit.

3.2.1 Board

Board		
Description	Hardware Version	Software Version
Main Board	HL1NINAMH	User release M MDA

1.3.1 Sub-Assembly

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
Adapter	HW-050300U00	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 50/60Hz 0.5A Output Voltage: 5V $\overline{=}$ 3A Rated Power: 5W
Adapter	HW-050300E00	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 50/60Hz 0.5A Output Voltage: 5V $\overline{=}$ 3A Rated Power: 5W
Adapter	HW-050300B00	Huawei	Input Voltage: ~100-240V 50/60Hz

Sub-Assembly			
Sub-Assembly Name	Model	Manufacturer	Description
		Technologies Co., Ltd.	0.5A Output Voltage: 5V $\overline{=}$ 3A Rated Power: 5W
Adapter	HW-050300A00	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 50/60Hz 0.5A Output Voltage: 5V $\overline{=}$ 3A Rated Power: 5W
Adapter	HW-050300J00	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 50/60Hz 0.5A Output Voltage: 5V $\overline{=}$ 3A Rated Power: 5W
Adapter	HW-050300R00	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 50/60Hz 0.5A Output Voltage: 5V $\overline{=}$ 3A Rated Power: 5W
Adapter	HW-050300I00	Huawei Technologies Co., Ltd.	Input Voltage: ~100-240V 50/60Hz 0.5A Output Voltage: 5V $\overline{=}$ 3A Rated Power: 5W
Battery	HB416683ECW	Huawei Technologies Co., Ltd.	Rated capacity: 3450mAh Nominal Voltage: $\overline{=}$ +3.8V Charging Voltage: $\overline{=}$ +4.35V

4 Main Test Instruments

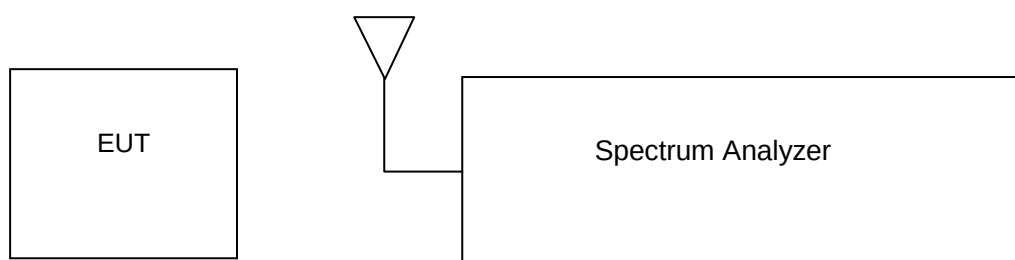
Equipment Name	Manufacturer	Model	Serial Number	Cal Date	Cal- Due
Power supply	KEITHLEY	2303	A120714713	2014-08-07	2016-08-06
Wireless Communication Test set	Agilent	N4010A	MY49081592	2014-11-04	2015-11-03
Universal Radio Communication Tester	R&S	CMU200	123299	2014-11-04	2015-11-03
Spectrum Analyzer	Agilent	N9020A	MY52090652	2015-07-08	2016-07-07
Universal Radio Communication Tester	R & S	CMW500	126854	2015-02-13	2016-02-12
Spectrum Analyzer	Agilent	E4440A	MY48250119	2015-07-08	2016-07-07
Signal Analyzer	R&S	FSQ31	200021	2014-11-04	2015-11-03
Spectrum Analyzer	Agilent	N9030A	MY49431698	2014-11-04	2015-11-03
Temperature Chamber	WEISS	WKL64	56246002940010	2015-02-13	2016-02-12
Signal generator	Agilent	E8257D	MY49281095	2014-11-04	2015-11-03
Vector Signal Generator	R&S	SMU200A	104162	2014-11-04	2015-11-03
Power Detecting & Sampling Unit	R&S	OSP-B157	100881	2014-09-08	2015-10-07
Signal Generator	Agilent	E4438C	MY47271904	2014-10-28	2015-10-27
Test receiver	R&S	ESU26	100387	2015-6-24	2016-06-23
Test receiver	R&S	ESCI	101163	2015-6-24	2016-06-23
Spectrum analyzer	R&S	FSU3	200474	2015-06-15	2016-06-14
Spectrum analyzer	R&S	FSU43	100144	2015-06-15	2016-06-14
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100262	2015-4-30	2017-4-29
LOOP Antennas(9kHz-30MHz)	R&S	HFH2-Z2	100263	2015-4-30	2017-4-29
Trilog Broadband Antenna (30M~3GHz)	SCHWARZ BECK	VULB 9163	9163-490	2015-4-30	2017-4-29
Trilog Broadband Antenna (30M~3GHz)	SCHWARZ BECK	VULB 9163	9163-520	2015-4-30	2017-4-29
Double-Ridged Waveguide Horn Antenna (1G~18GHz)	R&S	HF907	100304	2015-4-30	2017-4-29
double ridged horn antenna (0.8G-18GHz)	R&S	HF907	100305	2015-4-30	2017-4-29
Pyramidal Horn Antenna(18GHz-26.5GHz)	ETS-Lindgren	3160-09	5140299	2015-7-15	2017-7-14
Artificial Main Network	R&S	ENV4200	100134	2015-6-24	2016-6-23
Line Impedance Stabilization Network	R&S	ENV216	100382	2015-6-24	2016-6-23

5 Test Results

5.1 20dB Bandwidth Measurement

The 20dB bandwidth is measured with a spectrum analyzer connected via a receive antenna placed near the EUT while the EUT is operating in transmission mode.

5.1.1 Test Setup



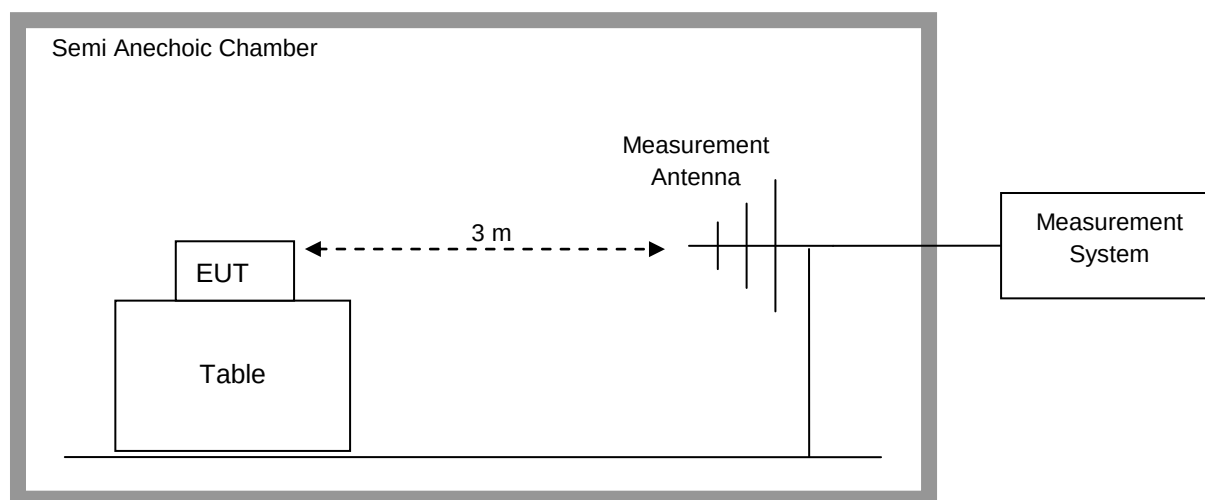
5.1.2 Test Result

Frequency	Occupied Bandwidth
13.56MHz	200KHz

The result of the measurement is passed.

5.2 In-Band Radiated Spurious Emission Measurements

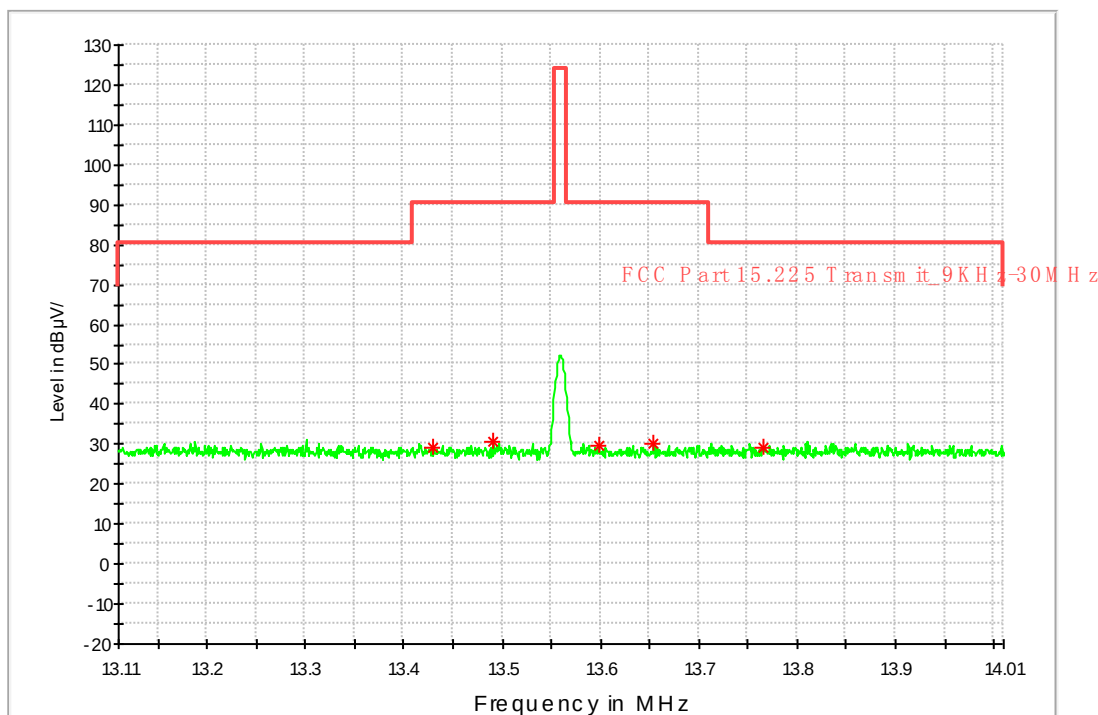
5.2.1 Test Setup



Measurement parameters	
Detector:	Quasi Peak
Sweep time:	-/-
Resolution bandwidth:	10 kHz
Video bandwidth:	10 kHz
Span:	-/-
Trace-Mode:	Max Hold

5.2.2 Test Result

Copy of FCC Loop Antenna 9KHz-30MHz



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Polarization	Azimuth (deg)	Correction (dB)	Marginal (dB)	Limit (dBμV/m)
13.42896	29.3	9.000	V	315.0	20.8	61.2	90.5
13.49160	30.5	9.000	V	149.0	20.8	60.0	90.5
13.59816	29.7	9.000	V	135.0	20.8	60.8	90.5
13.65432	30.3	9.000	V	135.0	20.8	60.2	90.5
13.76476	29.2	9.000	V	-1.0	20.8	56.2	80.5

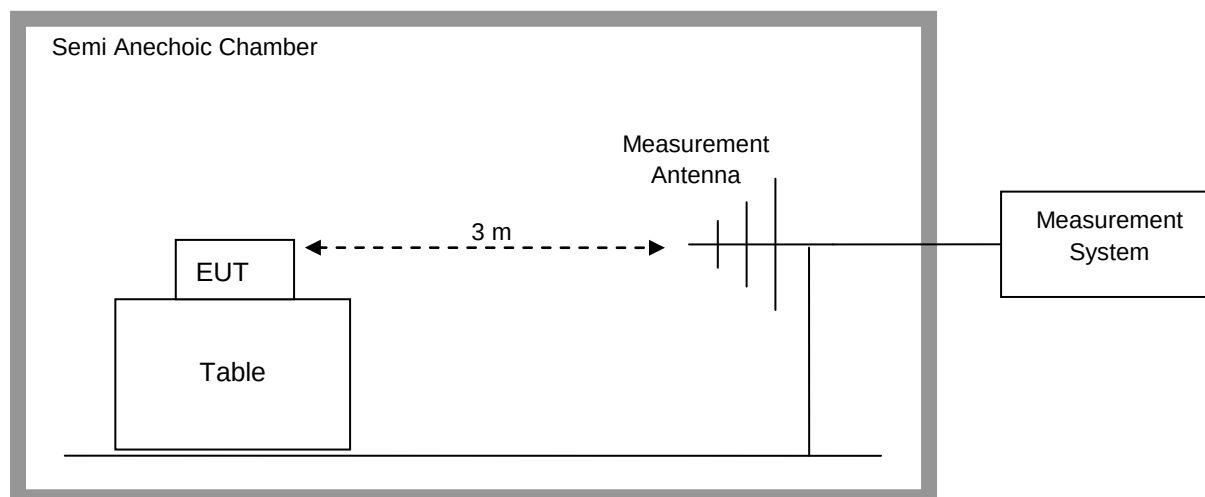
NOTES:

1. All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.
2. Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $20 \log_{10}(30/3)^2 = 40\text{dB}$
3. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector.

The result of the measurement is passed.

5.3 Radiated Spurious Emission Measurements, Out-of-Band

5.3.1 Test Setup

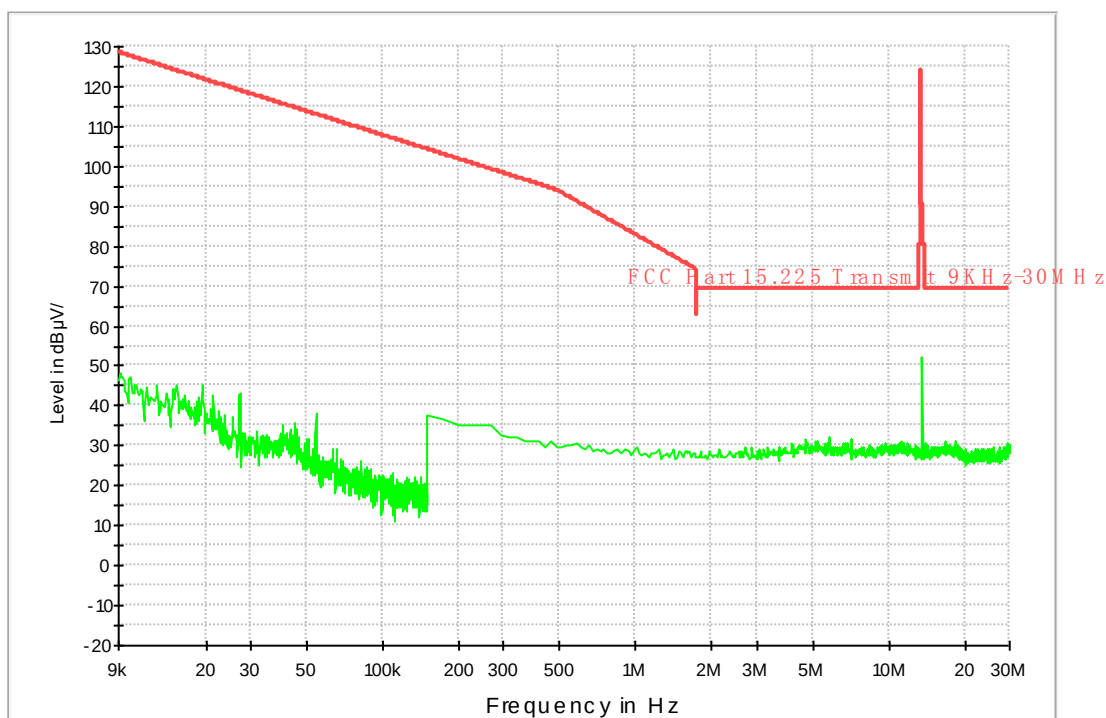


Measurement parameters	
Detector:	Quasi Peak
Sweep time:	Auto
Resolution bandwidth:	9 kHz – 150 kHz: 200 Hz 150 kHz – 30 MHz: 9 kHz 30 MHz – 1000 MHz: 100 kHz
Video bandwidth:	9 kHz – 150 kHz: 200 Hz 150 kHz – 30 MHz: 9 kHz 30 MHz – 1000 MHz: 100 kHz
Span:	See Plots
Trace-Mode:	Max Hold

5.3.2 Test Result

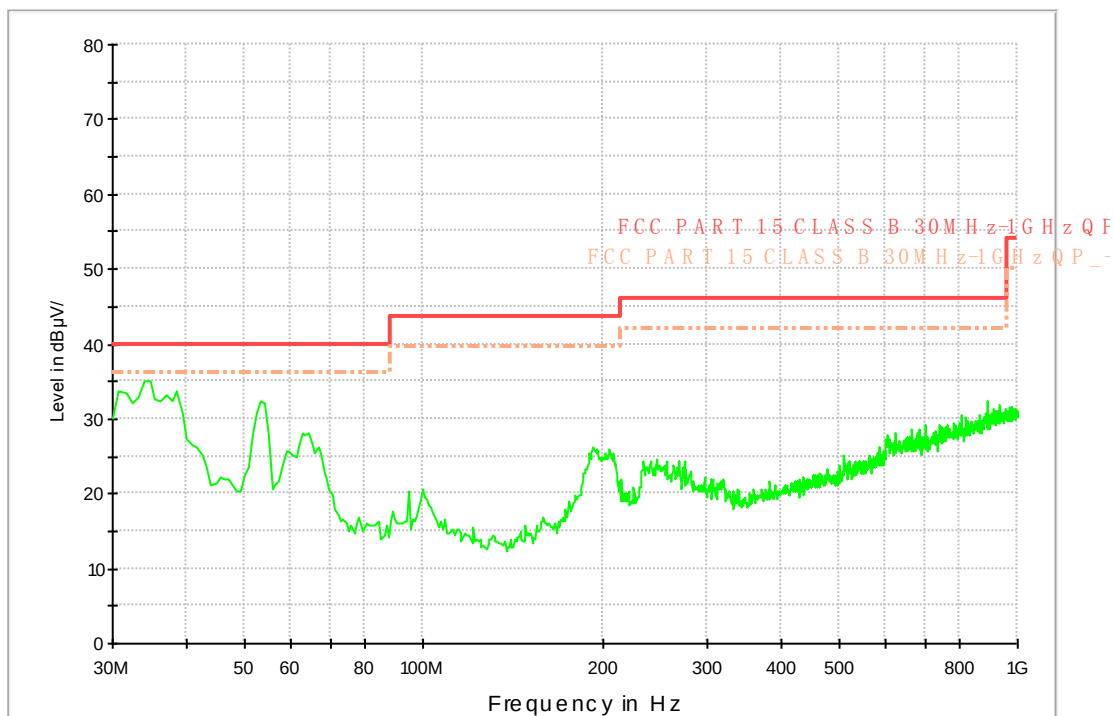
9k~30MHz

FCC Loop Antenna 9KHz-30MHz



30MHz~1GHz

FCC CLASS B RE 30MHz-1GHz



NOTES:

1. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector for emissions below 960MHz.
2. Both Vertical and Horizontal polarities of the receive antenna were evaluated with the worst case emissions being reported. Below 30MHz the Loop antenna was positioned in 3 separate radials.
3. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
4. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.

The result of the measurement is passed.

5.4 Frequency Stability

5.4.1 Test Setup

The EUT was placed in a Climatic Chamber. A small whip antenna was placed close to the EUT, and connected to the measuring Spectrum Analyzer. Measurement performed without modulation on TX.

5.4.2 Test Result

VOLTAGE (%)	POWER Battery	TEMP (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%		-20	13559980	13	0.0000009587035
100%		-10	13559983	-9	-0.0000006637176
100%		0	13560016	17	0.0000012536858
100%		10	13560011	21	0.0000015486713
100%		20	13560007	-15	-0.0000011061941
100%		30	13560012	8	0.0000005899700
100%		40	13560015	15	0.0000011061935
100%		50	13559987	-13	-0.0000009587030
Battery End Point	3.6	20	13560010	12	0.0000008849551
115%	4.35	20	13559987	14	0.0000010324494

The result of the measurement is passed.

-----The END-----